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EXHIBITION AND PRELIMINARY ACCOUNT OF A COLLECTION OF MICROPHOTOGRAPHS OF SNOW CRYSTALS, MADE BY W. A. BENTLEY.

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THE study of snow crystals dates back to the middle of the sixteenth century, when the first drawings appeared in the book of Olaus Magnus in 1555, and other early authors, including Des Cartes and Keppler, have described and figured these forms. In 1820, William Scoresby published 96 drawings of snow crystals made in the Arctic regions, in 1855 J. Glaisher 150, and in the same year Franke 119.

The first reproduction of microphotographs of snow crystals was in the small monograph of G. Hellmann in 1893 with about 60 examples,* and in the same year G. Nordenskiöld published about the same number.† In 1894 Hellmann published a plate of much larger pictures taken by a Russian photographer.‡

The present collection has been made by Mr. W. A. Bentley of Nashville, Vermont, during the last twenty years, and includes about 400 of the most interesting examples out of a total of 550 made by him. Through the disinterestedness of Mr. Bentley the collection has been acquired at a nominal cost for the Harvard Mineralogical Museum for study and public exhibition.

Its scientific value is enhanced by his notes, which comprise a number of meteorological observations made by himself at the time many of the

* Schneekrystalle-Beobachtungen und Studien, by Professor G. Hellmann, with eleven cuts and eight heliogravures after the micro-photographs of R. Neuhauss, M. D. Berlin, Rudolph Muckenberger. The historical summary given above is taken from this work.

† Preliminary Communication concerning an Investigation of Snow Crystals. Geol. Foren. i Stockholm. Forh. Bd. 15, pp. 146-158. 1893. English summary in Nature, Vol. XLVIII. pp. 592-594.

‡ Meteorologische Zeitschrift, 1894, p. 281.

sets from individual storms were made, including date, temperature, snow fall, condition of the clouds, direction and force of the wind, and sometimes notes as to the general character of the snow crystals and their changes as the storm progressed.

The magnifications used range from 52 to 31 diameters, and are evidently much higher than those of previous collections. The same general types of crystals noticed by previous observers recur here, such as the star form, star form with solid nucleus, and tabular form, while the columnar form (hexagonal prism and base) is rare, and the hexagonal pyramid is not seen. Variations of skeleton growth of hexagonal plates, comprising the base and prism of the first order, predominate; less commonly the intermediate axes are visible by lines of growth or air inclusions, and rarely a triangular development suggests rhombohedral symmetry. The presence of the varied markings due to inclusions of air is much more prominent in these than any as yet published, owing to the higher magnification and the superb technique of the photographs. Mr. Bentley also confirms the previous observation, that large stellate crystals are more common at the higher temperatures and the tabular ones at the lower.

Some photographs of frost crystallizations are included.

Reserving for a future communication the result of more detailed study, a preliminary account is here given of this large and perfect collection which may justly be called a monument to the patience, skill, and enthusiasm of the maker.*

* In "A Study of Snow Crystals," recently published in Appleton's Popular Science Monthly, (May, 1898, pp. 75-82,) by W. A. Bentley and G. H. Perkins, the authors give some account of this collection, with a reproduction of 27 examples.